

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

PUBLICATION NUMBER : 08236105  
PUBLICATION DATE : 13-09-96

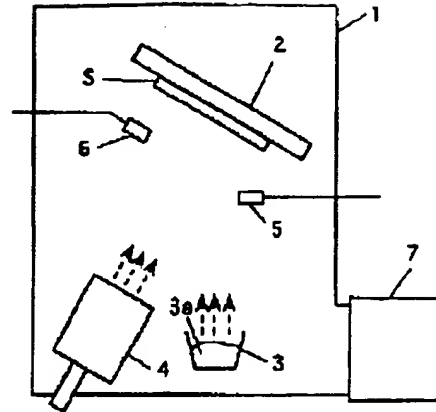
APPLICATION DATE : 28-02-95  
APPLICATION NUMBER : 07039772

APPLICANT : NISSIN ELECTRIC CO LTD;

INVENTOR : NISHIYAMA SATORU;

INT.CL. : H01M 4/04 C23C 14/48

TITLE : MANUFACTURE OF LITHIUM  
SECONDARY BATTERY POSITIVE  
ELECTRODE



ABSTRACT : PURPOSE: To manufacture a lithium secondary battery positive electrode with high film-adhesion property and excellent characteristic of battery by forming a metal oxide film containing lithium on an electrode substrate by jointly using vapor deposition of a lithium containing material and ion beam irradiation.

CONSTITUTION: A lithium-containing material is vaporized from a vaporizing source 3 inside a vacuum chamber 1 having an exhaust device 7, and a vaporized material 3a is vapor-deposited on an electrode substrate S mounted on a base holder 2. At the same time, ion beams are irradiated on the substrate S from an ion source 4. A lithium-containing metal oxide film is formed on the substrate S. As the lithium-containing metal oxide,  $\text{LiMn}_2\text{O}_4$ ,  $\text{LiWO}_3$ ,  $\text{LiCoO}_2$ ,  $\text{LiNiCoO}$ , and  $\text{LiV}_2\text{O}_5$  are used. This ion beam is preferably formed by using an inert gas or an oxygen gas as a raw gas, and an accelerating energy of 100eV-500KeV. By using the lithium-containing metal oxide film as the positive electrode of a lithium secondary battery, the mobility of a lithium ion on the inside hardly drops and desirable battery characteristics is easily obtained.

COPYRIGHT: (C)1996,JPO